

Please amend the specification as shown:

Please delete the paragraphs on page 4, line 17 to page 15, line 22 and replace them with the following paragraphs:

According to the invention, "glycosylated MUC1 tumor epitope" is understood to be an epitope which comprises at least one PDTRP sequence (SEQ ID NO: 81) of the MUC1 tandem repeat and is glycosylated with GalNAc or Gal-GalNAc on the PDTRP (SEQ ID NO: 81) threonine.

According to the invention, specific binding of the glycosylated MUC1 tumor epitope is understood to be binding of the recognition molecules of the invention, comprising a combination of the following binding properties:

- a) Binding in test methods as described in Example 5 to the glycosylated PDTRP (SEQ ID NO: 81) region within a MUC1 tandem repeat sequence which consists of 1 to 1.5 tandem repeats (molecule comprised of 30 amino acids, see Example 5) and is glycosylated with GalNAcalpha1-O-Thr (referred to as GalNAc hereinbelow) or Galbeta1-3GalNAcalpha1-O-Thr (referred to as Gal-GalNAc hereinbelow) on the threonine, the binding strength being increased many times over compared to the non-glycosylated peptide of same length and peptide sequence. As defined herein, "increased many times over" means that the binding ratio of the PDTRP-glycosylated (SEQ ID NO: 81) MUC1 glycopeptide to non-glycosylated peptide reaches a factor of >4.5 in a test as described in Example 5.1 (using the MUC1 peptide or glycopeptide described therein, having a length of 30 amino acids which corresponds to 1.5 tandem repeats).
- b) Binding in test methods as described in Example 5.2 to multiple non-glycosylated MUC1 tandem repeats consisting of at least 3 tandem repeats, preferably 5 tandem repeats.
- c) Statistically significantly reduced binding to tumor cell-released MUC1 present in the serum of colon carcinoma patients compared to antibodies of the CA15-3 test (Example 11) and of HMFG-1 (likewise cf. Example 11). The test method used to this end is illustrated in more detail in Example 11.
- d) As described in Example 6, the interaction between antigen and recognition molecule is either increased or not influenced by neuraminidase treatment.
- e) There is no or barely detectable binding to colon normal tissue and specific strong binding to colon tumor tissue (see Example 6).

Please delete Table 2 and replace it with the following table:

Table 2 (FRH1-4 disclose SEQ ID NO: 82 and FRL1-4 disclose SEQ ID NO: 83):

Name	Position range	Pos.	Amino acid or amino acid sequence
FRH1	1 to 30 (SEQ ID NO: 84)	1	E
		2	V
		3	K
		4	L
		5	V
		6	E
		7	S
		8	G
		9	G
		10	G
		11	L
		12	V
		13	Q
		14	P
		15	G
		16	G
		17	S
		18	M
		19	K
		20	L
		21	S
		22	C
		23	A or V
		24	A, V, S or T
		25	S
		26	G
		27	Y, F, S or D
		28	T
		29	F, L or I
		30	S
CDRH1	31 to 35		SEQ ID NO. 1 or 2 and

			variants
FRH2	36 to 49 (SEQ ID NO: 85)	36	W
		37	V
		38	R
		39	Q
		40	S
		41	P
		42	E
		43	K
		44	G
		45	L
		46	E
		47	W
		48	V
		49	A
CDRH2	50 to 65, with positions 52a, 52b and 52c introduced in addition		SEQ ID NO. 3 or 4 and variants
FRH3	66 to 94 (SEQ ID NO: 86)	66	R
		67	F
		68	T
		69	I
		70	S
		71	R
		72	D
		73	D or V
		74	S
		75	K
		76	S
		77	S
		78	V
		79	Y or S
		80	L
		81	Q

		82	M
		82a	N
		82b	N
		82c	L
		83	R
		84	A or V
		85	E
		86	D
		87	T
		88	G
		89	I
		90	Y
		91	Y
		92	C
		93	T
		94	R, G, N, K or S
CDRH3	95 to 102; pos. 100 non-existent and pos. 99 partially non-existent		SEQ ID NO. 5 or 6 and variants
FRH4	103 to 113 (SEQ ID NO: 87)	103	W
		104	G
		105	Q
		106	G
		107	T
		108	T
		109	L
		110	T
		111	V
		112	S
		113	S or A
FRL1	1 to 23 (SEQ ID NO: 88)	1	D
		2	I, V or L
		3	V
		4	M or L

		5	T
		6	Q
		7	T or A
		8	P or A
		9	L or F
		10	S
		11	L or N
		12	P
		13	V
		14	S or T
		15	L
		16	G
		17	D or T
		18	Q or S
		19	A
		20	S
		21	I
		22	S
		23	C
CDRL1	24 to 34, with positions 27a, 27b, 27c, 27d and 27e introduced in addition		SEQ ID NO. 7 or 8 and variants
FRL2	35 to 49 (SEQ ID NO: 89)	35	W
		36	Y
		37	L
		38	Q
		39	K
		40	P
		41	G
		42	Q or L
		43	S
		44	P
		45	K or Q

		46	L
		47	L
		48	I or V
		49	Y
CDRL2	50 to 56		SEQ ID NO. 9 or 10 and variants
FRL3	57 to 88 (<u>SEQ ID NO: 90</u>)	57	G
		58	V
		59	P
		60	D
		61	R
		62	F
		63	S
		64	G or S
		65	S
		66	G
		67	S
		68	G
		69	T
		70	D
		71	F
		72	T
		73	L
		74	K or R
		75	I
		76	S
		77	R
		78	V
		79	E
		80	A
		81	E
		82	D
		83	L or V

		84	G
		85	V
		86	Y
		87	Y
		88	C
CDRL3	89 to 97		SEQ ID NO. 11 or 12 and variants
FRL4	98 to 108 (<u>SEQ ID NO: 91</u>)	98	F
		99	G
		100	G or D
		101	G
		102	T
		103	K
		104	L
		105	E
		106	I or L
		106a	K
		107	R
		108	A

Please delete the paragraph on page 63, lines 5-14 and replace it with the following paragraph:

Various synthetic peptides and glycopeptides were used as antigens: a non-glycosylated 30mer with the sequence APPAHGVTSAPDTRPAPGSTAPPAHGVTS (SEQ ID NO: 70); a glycosylated 30mer with the sequence APPAHGVTSAPDT[GalNAc α]RPAPGSTAPPAHGVTS (SEQ ID NO: 71), a series of non-glycosylated MUC1 peptides of varying length with the sequence [VTSAPDTRPAPGSTAPPAHG]_n (SEQ ID NO: 72), wherein n = 1, 3 and 5 (TR1, TR3 and TR5), and a series of glycosylated MUC1 peptides of varying length with the sequence A[HGVTSAPDT(GalNAc α)RPAPGSTAPPA]_n (SEQ ID NO: 73), wherein n = 1, 3 and 5 (TR1g, TR3g and TR5g).

Please delete the paragraph on page 64, lines 6-7 and replace it with the following paragraph:

5.1. Binding to the glycosylated PDTRP (SEQ ID NO: 81) region within an MUC1 tandem repeat sequence

Please delete the paragraphs on page 85, line 6 to page 86, line 33 and replace them with the following paragraphs:

Fig. 2: Cloning diagram for the preparation of single-chain antibody fragments having different linker length (6 His tag is disclosed as SEQ ID NO: 92).

Fig. 3: Vector system for cloning and eukaryotic expression of chimeric antibodies in IgG1 or IgM format (SEQ ID NOS 75-80 are disclosed, respectively, in order of appearance).

Fig. 4: Binding of the recognition molecules of the invention, mIgG-Panko1 and mIgG-Panko2, to glycosylated and non-glycosylated MUC1 peptide in an ELISA. The non-glycosylated 30mer with the sequence APPAHGVTSAPDTRPAPGSTAPPAHGVTS (SEQ ID NO: 74) and the glycosylated 30mer with the sequence APPAHGVTSAPDT[GalNAc α]RPAPGSTAPPAHGVTS (SEQ ID NO: 71) were used as antigens and bound in PBS to the plate. The mIgG-Panko1 and mIgG-Panko2 antibodies were employed at a concentration of 0.5 μ g/ml in the ELISA.

Fig. 5: Comparison of specific binding of the anti-MUC1 antibodies HMFG-1, C595 and SM3 with mIgG-Panko1 and mIgG-Panko2 to glycosylated and non-glycosylated MUC1 peptide in an ELISA. The non-glycosylated 30mer with the sequence APPAHGVTSAPDTRPAPGSTAPPAHGVTS (SEQ ID NO: 74) and the glycosylated 30mer with the sequence APPAHGVTSAPDT[GalNAc α]RPAPGSTAPPAHGVTS (SEQ ID NO: 71) were used as antigens and dried slightly on the plate in H₂O. The antibodies were employed at a concentration of 10 μ g/ml in the ELISA.

Fig. 6: Specific binding of various preferred formats of recognition molecules of the invention in an ELISA, exemplified using non-glycosylated and glycosylated 30mer MUC1 peptide. The non-glycosylated 30mer with the sequence APPAHGVTSAPDTRPAPGSTAPPAHGVTS (SEQ ID NO: 74) and the glycosylated 30mer with the sequence APPAHGVTSAPDT [GalNAc α]RPAPGSTAPPAHGVTS (SEQ ID NO: 71) were used as antigens and bound in PBS to the plate. The two scFv formats SEQ ID Nos. 36 and 45 were used with 0.5 μ g/ml, the murine IgG with 0.1 μ g/ml and the chimeric IgG with 0.01 μ g/ml. As different secondary antibodies are used for these various formats, the ELISA data should be assessed merely qualitatively.

Fig. 7: Dependence of binding of the recognition molecules mIgG-Panko1 and mIgG-Panko2 of the invention on the number of tandem repeats in non-glycosylated MUC1

peptides compared to the MUC1-specific antibodies SM3 and C595 in an ELISA. A series of non-glycosylated MUC1 peptides of varying length with the sequence [VTSAPDTRPAPGSTAPPAHG]_n (**SEQ ID NO: 72**), wherein n = 1, 3 and 5 (TR1, TR3 and TR5), was used as antigens and dried slightly on the plate in H₂O. The antibodies were employed at a concentration of 10 µg/ml.

Fig. 8: Dependence of binding of the recognition molecules mIgG-Panko1 and mIgG-Panko2 of the invention on the number of tandem repeats (multiple glycosylated PDTR regions) compared to the MUC1-specific antibodies SM3 and C595 in an ELISA. A series of glycosylated MUC1 peptides of varying length with the sequence A[HGVTSAPDT(GalNAc α)RPAPGSTAPPA]_n (**SEQ ID NO: 73**), wherein n = 1, 3 and 5 (TR1, TR3 and TR5), was used as antigens and dried slightly on the plate in H₂O. The antibodies were employed at a concentration of 10 µg/ml.